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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/224,759	01/04/1999	TOSHIHARU FURUKAWA	BU9-98-179	3284

23123 7590 01/27/2003

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SUITE # 101
MESA, AZ 85201

EXAMINER

GARCIA, JOANNIE A

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 01/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/224,759

Applicant(s)

FURUKAWA ET AL

Examiner

Joannie A Garcia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10,14,15,17,23,24 and 36-53 is/are pending in the application.

4a) Of the above claim(s) ____ is/are withdrawn from consideration.

- 5) ☒ Claim(s) 52 and 53 is/are allowed.

- 6) ☒ Claim(s) 1,2,4-10,14,15,17,23,24 and 36-51 is/are rejected.

- 7) ☐ Claim(s) ____ is/are objected to.

- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Claims 25-35 have been renumbered as claims 40-53 according to rule 37 CFR 1.126.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-10, 14, 15, 17, 23, 24, and 36-51, are rejected under 35 U.S.C. 103(a) as being unpatentable over Mase et al, Moslehi et al, and the following comments.

Mase et al, Moslehi et al, and the following comments, are applied as stated in the Office Action mailed 07-05-02, and as stated below.

Applicant argues that Mase et al does not disclose selectivity to laser-absorbing polysilicon. However, Mase et al is not relied upon for that purpose. Mase et al is relied upon for teaching formation of a plurality of polysilicon portions of gate conductors 14 on a substrate having a semiconductor portion 80 (Figure 7, Column 9, lines 60-67, and Column 10, lines 35-52), trimming at least an electrically significant portion of the polysilicon portion by a selective film growth method, such as selective surface nitridation (Figures 4 and 8, Column 10, lines 53-55, and Column 11, lines 3-5), compensating n-channel and p-channel devices (Column 6, lines 54-60, and Column 12, lines 47-50), at least partially removing the trimming film (Column 11, lines 3-5), anisotropically etching the trimming film to form gate conductor spacers 13 (Figures 4 and 8, Column 11, lines 9-27), and forming an additional oxide layer 17 on the trimming film (Figure 7, Column 6, lines 17-22, Column 9, lines 60-67, and Column 11, lines 28-31).

Applicant argues that Mase et al does not disclose trimming an electrically significant portion of the polysilicon using a nitridization process, and making electrically changes to the gate by mean of selective nitridation. However, Mase et al discloses that gate electrode 14 becomes smaller due to the nitridation process (Figures 4 and 8, and Column 11, lines 3-5), therefore achieving electrically changes to the gate by means of said selective nitridation process.

Applicant argues that Mase et al does not disclose compensating n-channel and p-channel devices. However, Mase et al discloses device compensation for n-channel or p-channel devices (Column 6, lines 54-67, and Column 12, lines 47-52).

Applicant argues that Mase et al does not disclose using his method to differentially size and shape the gates to obtain coordinated operational speeds. However, the claims are not so limited.

Applicant argues that Mase et al does not teach forming additional nitride or oxide layers on the trimming film. However, Mase et al discloses forming an additional oxide layer 17 on the trimming film (Figure 7, Column 6, lines 17-22, Column 9, lines 60-67, and Column 11, lines 28-31).

Applicant argues that Moslehi et al does not teach absorption of laser energy into polysilicon. However, Moslehi et al is not relied upon for that purpose. Moslehi et al was relied upon for disclosing the use of laser and ammonia for growing thermal nitrides of silicon (Column 1, lines 21-31).

Mase et al discloses trimming at least an electrically significant portion of the polysilicon portion by a selective film growth method, such as selective surface nitridation (Figures 4 and 8, Column 10, lines 53-55, and Column 11, lines 3-5). Mase et al does not disclose performing the

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selective surface nitridation using a laser. Moslehi et al discloses the use of laser and ammonia for growing thermal nitrides of silicon for VLSI devices (Column 1, lines 15-38). It would have been a matter of routine optimization within the teachings of Moslehi et al and Mase et al to determine suitable expose pulses, depth, energy, pressure, flow, and wavelength, to achieve the thermal nitrides formation step of Moslehi et al and the gate trimming step of Mase et al. It would have been within the scope of one ordinary skill in the art to combine the teachings of Mase et al and Moslehi et al to enable the gate conductor trimming step of Mase et al to be performed and also to obtain ultra-thin, high quality insulators (Moslehi et al, Column 1, lines 15-18).

Applicant argues that Moslehi et al does not teach how the laser is used to form a nitride. However, Moslehi et al discloses that laser is within the techniques used to grow thermal nitrides (Column 1, lines 25-31).

Claims 52-53 are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. See **MPEP 203.08**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner J. Garcia whose telephone number is (703) 306-5733. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax number for this group is (703) 308-7722 (and 7724), and (703) 305-3431 (and 3432). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.


JAG
1/23/03


George J. Bourson
Primary Examiner
2823